DRAFT Strategic Plan Section- - v5

Technical Infrastructure

The technical infrastructure of the Arkansas Health Information Exchange Initiative is subject to available funding. The initiative will be based on proven industry-standard technologies utilized across the State, coupled with emerging technologies to ensure the Arkansas Health Information Exchange (HIE) will be scalable, interoperable, and standards-based; and will meet NHIN requirements. Arkansas's goal is to provide the foundation for adopting and implementing meaningful use criteria and to provide a structured mechanism to ensure health and medical systems adhere to the federal standards and accurately communicate with the Arkansas HIE (HIE). The HIE will continue throughout its development to coordinate with Medicare as well as Medicaid to meet requirements for information exchange.

The overall strategy for the technical architecture is to provide connectivity services that enable the advancement/improvement of:

- Quality of care and patient outcomes
- Cost effectiveness of care delivery
- Public health capabilities

The development of a strategy for a technical design will require establishing a set of design principles and requirements that will guide the strategy, planning, and deployment of the statewide health information exchange. Generally, the design of the system will need to be technology and vendor neutral, and focus on standards-based technology, protocol, and architectural concepts. Recognizing that there are a number of providers and other health care entities that have various levels of information technology resource sophistication, it will be required that the HIE concurrently support a broad spectrum of data exchange capabilities as the environment evolves.

The approach to deployment of the technical infrastructure is to develop a phased implementation plan consistent with the funding available and in coordination with other statewide initiatives such as Regional Extension Centers and Medicaid Management Information Systems (MMIS). The general phases of HIE implementation are:

1. Operational Planning
2. Proof of Concept implementation and demonstration
3. Phased implementation of HIE and NHIN integration

The AR HIE will implement as part of its technical infrastructure the standards including security, messaging, and other services prescribed by the NHIN functionality standards. Given the funding allocation and sustainability model as well as the constraints of time, it is likely that the AR HIE functionality will be purchased rather than built. Vendor selection will therefore be a key component of initial operational planning and execution. Vendor products must meet the requirement for non-proprietary protocol and interoperability as applied in the HIE architecture.

Interoperability

The technical infrastructure of the Arkansas HIE will support recognized data standards, code sets, and exchange standards for each component architectural layer. Those layers include technical, privacy and security, administrative context, clinical context, and the NHIN. The HIE will be designed to permit participants (clinical and administrative) to incrementally migrate from a basic exchange to full integration as national, state, and user-based standards and associated technologies evolve. The role of the HIE will be to incorporate data from many sources and formats as standards and technologies evolve to facilitate exchange and to meet national standards.

The HIE will seek to capitalize on existing community, private, and public, health information exchange capabilities to build a state-wide HIE. The HIE will participate with other participants in the NHIN to facilitate and promote care coordination with local Veterans Administration, Indian Health Services, public health, and military health systems (DOD). (There are no Indian Health Services entities within the State of Arkansas.) As previously, mentioned, the HIE will coordinate with Medicare and Medicaid in support of information exchange and interoperability.

The prioritized focus of the HIE for interoperability and meaningful use criteria will be:

1. **Clinicians** (physicians, nurses, hospitals, clinics, laboratories, pharmacies)
2. **Citizens** (patients, consumers)
3. **Public health** entities, including registries
4. **Payers** (private and public)

It is anticipated that HIE services adoption will necessarily need to be phased in as providers are at varying levels of sophistication related to electronic capabilities. This strategic plan and the associated operational plan are built upon a proof of concept and a phased approach that is intended to promote implementation of technology and end user adoption. This phased approach will capitalize to the extent possible on existing technologies and community HIEs within the State and on a scale and schedule that is fiscally sustainable. While the HIE services will be proven and phased in over time as described in the Operations Plan, it is the goal of the HIE to support the provision of these services upon its completion of the proof of concept phase (2011):

- Eligibility and claims transactions
- Electronic prescribing and refill requests
- Medication fill status and history [physician]
- Electronic clinical laboratory ordering and results delivery [physician]
- Electronic public health reporting
- Quality reporting
- Clinical summary exchange

This plan may have to be updated as the final rules governing Meaningful Use are published in 2010. It is the mission of the HIE to support physicians, institutional providers, and other health constituencies in meeting the requirements for Meaningful Use of health information.

The HIE will coordinate with the state Medicaid MMIS to provide the information sharing infrastructure for exchange of electronic eligibility, claims, medication ordering and tracking, patient interaction, and quality reporting. As the state Medicaid department advances its selection of the MMIS, the HIE will work directly to provide and support the electronic information exchange component of that system for Medicaid providers and patients. [Why single out Medicaid here?]

Technical Architecture/Approach. The key overall principles for the HIE are:

1. The HIE will provide an infrastructure that is **secure** and protects the **privacy** of consumers, providers, and other constituents. Participants can be confident that their health care data is secure, private, and appropriately accessed.
2. The HIE will **improve the health care delivery** process in Arkansas by providing information availability when and where it is needed.
3. **Best practices and standards** for information technology infrastructure will be utilized in the creation of the HIE.
4. **NHIN standards** specifications will be implemented in establishment of the NHIN Gateway functionality.
5. The HIE technical infrastructure will attempt to **leverage existing resources** to the extent possible and capitalize on current health exchanges within Arkansas.
6. The HIE architecture will support an **incremental deployment** of a statewide exchange capability.
7. Start with **proof of concept** and expand as rapidly as technologically and operationally feasible within the financial constraints of the project.

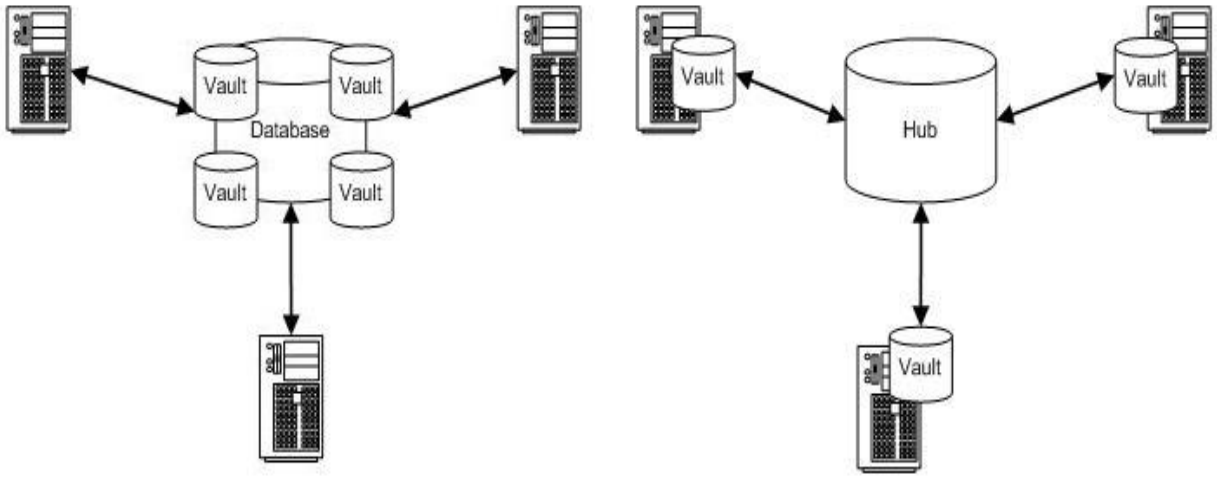
Design principles and requirements. The following are proposed design principles and requirements for the Arkansas Health Information Exchange.

1. The HIE will be "**vendor neutral**", i.e. vendor products that must be interoperable with others.
2. The HIE will **rely upon a network**, or infrastructure, to provide backbone service functionality.
3. The HIE will be **a "hybrid" architecture**; not completely federated nor centralized.
4. HIE will be focused on **facilitating exchange of information** rather than the end user application functionality.
5. HIE will comply with current **interoperability standards** available in the market today.
6. HIE must **interoperate with existing community and private health information exchanges** as well as the NHIN infrastructure.
7. The HIE technical architecture will be **scalable**, i.e. easy to add more users, work volume, and transaction counts.
8. The HIE technical architecture will be **expandable**, i.e. easy to add new services and functionality.
9. The HIE will utilize **standard security protocols** supporting user authorization, authentication, and administration. It also should support security auditing functions.
10. The HIE will utilize **standard data storage protocols** normally associated with large information technology solutions and available in the market today.

11. The HIE will be supported by an industry standard **business continuity and disaster recovery** infrastructure and processes.

Architectural Overview. The Arkansas HIE will utilize a [*hybrid*] federated architecture of decentralized databases that are connected across the exchange to share and exchange information. A master patient index and record locator service will be used to provide patient/record matching services. The central service "hub" provides MPI and record locator services. Data storage is provided at decentralized "vaults" -either physical or virtual.

[Need a cleaner drawing of the high level architecture schematic.]



- Features
  - Central hub contains master index of patients in the participating systems.
  - Queries are made to the replicated vaults from participating systems directly or through a central hub application
  - Standards (HL7, etc.) for data, messages, and communication
  - Data remains close to its source (Hybrid 2)
  - System can discover the location of relevant records housed community-wide
  - Scalable
  - Easier to incrementally add participant systems
  - Less real time dependence on participant systems
  - Supports access control and data protection
  - Facilitates system-wide data analysis

Core Requirements. The HIE core components are:

1. **Master patient index**: used to link specific patients to specific data. Includes a "record locator service" and "mismatch" reconciliation processes. This component must allow human intervention to manage possible duplication and may create a system assigned Universal Patient Index (UPI) used internally.
2. **Data Dictionary and vocabulary standardization**: needed to create a "data normalization" process for diseases, lab results, diagnosis, and decision support.
3. **Provider index & directory**: used to identify and locate providers (doctors and other providers)
4. **Standards Based**: utilizes standard communication protocols, nomenclature, and clinical terminology including, but not limited to, HL7 Clinical Document Architecture, SNOMED CT, and ICD-10. Other standards, or evolving standards, are:
    a. SOAP
    b. CCD – Continuity of Care Document
    c. XML
    d. DICOM
    e. LOINC
5. **Security:** user authentication, authorization, and access control including audit logging
6. Ability to complete any current and future required HIE competencies/certifications

Operational Plan Guidelines. As will be set forth in the Operational Plan, the HIE development will be conducted within a framework designed to ensure successful deployment and accelerated adoption. The HIE development and deployment will conform to the funding model and to the design principles herein. The following guidelines, or assumptions, will guide the development of the operational plan:

1. The HIE is focused on the provider/stakeholder/community needs for health information.
2. It is likely that funding and timing constraints will lead to the selection of a vendor solution.
3. The HIE will initially provide exchange of data that exists currently in electronic form.
4. The HIE will be developed in a phased approach:
    a. Proof of concept, or pilot implementation (9-12 months)
    b. Integration with REC initiative and Medicaid information systems
    c. Initial implementation to a limited, broader set of users (9-12 months)
    d. Broad implementation of HIE capabilities to additional providers